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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,856	11/08/2002	Garry E. Jacobs	325.144-US	8550
24392	7590	12/12/2005	EXAMINER	
RUTAN & TUCKER, LLP ROBERT D. FISH P.O. BOX 1950 COSTA MESA, CA 92628-1950			BUSHEY, CHARLES S	
			ART UNIT	PAPER NUMBER
			1724	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,856

Applicant(s)

JACOBS ET AL.

Examiner

Scott Bushey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 1 and 14 recite the broad recitation of a divider length of at least 50% of the distance measured between the top of the riser and the bottom of the cap, and the claims also recite that

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the divider length is selected in a manner to increase the hydraulic resistance in the space, which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Applicant's statement, in the remarks section of the reply filed October 27, 2005, that the subject matter of the claims was commonly owned at the time the invention was made, is noted.

5. Claims 1-10, and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ballard et al taken together with Madsen.

Ballard et al (Figs. 1, 2, 5-7, 13; col. 1, lines 39-44; col. 3, lines 69-71; col. 5, lines 44-46, 48-49, 53-62; col. 8, lines 43-47, 52-57, 63-65; col. 9, lines 9-13; col. 10, lines 17-28) teaches a bubble cap system for connection to a distribution plate within a cocurrent downflow reactor, wherein co-current upflow of the phases exists within the space between the riser and the cap of the bubble cap structure. Ballard et al also disclose a divider structure (318) between the riser and the cap, and a slot length within the cap that may be about $\frac{1}{2}$ of the length of the cap itself, and that the cap may have a vertical dimension of roughly about 9 inches. Wherein half of roughly 9 inches, is about $4\frac{1}{2}$ inches, which approximates the slot length of 5 inches as recited by instant claim 20, absent an unexpected showing of criticality it would have been obvious to an artisan

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at the time of the invention, to modify the slot length of the Ballard et al apparatus from about 4 ½ inches, as specifically taught by the reference, to 5 inches as recited by instant claim 20, such slot length being dictated by the liquid depth on the tray, as clearly discussed by Ballard et al.

Ballard et al also substantially disclose applicant's invention as recited by instant claims 1-10, and 12-19, except for the specific recitation that the divider disposed in the space between the riser and the cap has a length of at least 50% of the distance between the top of the riser and the bottom of the cap.

Madsen (Fig. 3) clearly teaches a bubble cap including a plurality of dividers (15) having a length in excess of 50% of the distance between the top of the riser and bottom of the cap. It would have been obvious to an artisan at the time of the invention, to modify the length of the divider of Ballard et al to be at least 50% of the distance between the top of the riser and bottom of the cap, in view of Madsen, since such would provide a convenient means for affecting the flow through the space by segmenting the flow along a majority of the length of the space, thereby reducing turbulence within the space. With respect to instant claims 2-4, 9, and 10, regarding the specific recitation that the divider has a length of 70% to 100% of the distance between the top of the riser and bottom of the cap, and that the cap has three to six dividers, Madsen does clearly teach a plurality of dividers (15) having a length in excess of 50% of the distance between the top of the riser and bottom of the cap. Wherein such a divider length would clearly affect the flow through the space by segmenting the flow along a majority of the length of the space, thereby reducing turbulence within the space, it would have been

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obvious to an artisan at the time of the invention, to modify the length of the dividers and the number thereof, as taught by Ballard et al, in view of Madsen, to provide the desired level of flow control within the space of the bubble cap of Ballard et al, such modifications being dictated by the vapor/liquid ratio and the flow volume through the device per unit time. With respect to the precise divider length selected, one having ordinary skill in the art at the time of the invention would obviously recognize the tradeoff between increased mixing of the phases due to increased hydraulic resistance to flow found in a cap with a longer divider structure and undue pressure drop across the bubble cap that would also result from a longer divider length. Furthermore, one having ordinary skill in the art would have found it to have been obvious at the time of the invention, to modify the length of the dividers within the Ballard et al bubble cap to any desired degree greater than 50% of the distance between the top of the riser and the bottom of the cap, in view of Madsen, since such would clearly provide a more stable and sturdy bubble cap structure, thereby insuring uniform mixing within each of the spaces between the riser and cap as formed by the dividers.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the reference combination as applied to claims 1-10, and 12-20 above, and further in view of Jacobs et al '965.

The reference combination as applied to claims 1-10, and 12-20 above substantially discloses applicant's invention as recited by instant claim 11, except for the swirl director attached to the riser.

Jacobs et al '965 (Figs. 16-19; col. 21, lines 22-61, 66, 67; col. 22, lines 1-8) disclose swirl director means (460) attached to the riser of a bubble cap. Wherein the dividers of the reference combination as applied to claims 1-10, and 12-20 above provide a more uniform flow within the space between the riser and the cap, it would have been obvious to an artisan at the time of the invention, to modify the bubble cap of the primary reference combination to include swirl directors, in view of Jacobs et al '965, since such would further enhance the uniformity of flow within the bubble cap, as taught by Jacobs et al '965 (note col. 21, lines 57-59).

Response to Arguments

7. Applicant's arguments filed October 27, 2005 have been fully considered but they are not persuasive.

Regarding applicant's first point of argument, that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the skilled artisan would recognize the advantages provided by the longer dividers as taught by Madsen, such as increased stability of the bubble cap structure by virtue of the increased bracing of the cap relative to the riser.

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Regarding applicant's second point of argument, the Examiner cannot disagree that "reduction in turbulence decreases turbulence".

Regarding applicant's third point of argument, that Madsen cannot be used to modify Ballard et al, since the device would be inoperable for its intended purpose, such is not persuasive. Wherein the instant claims, and each of the applied prior art references are directed to a bubble cap, having a riser, a slotted cap and a divider between the riser and cap, the references are clearly directed to art analogous to the claimed invention. Furthermore, the claims are directed to an apparatus, not a process. Lastly, there is no structure within the "bubble cap" of Madsen that would disallow the bubble cap of Madsen to be capable of use in the manner as taught by Ballard et al.

Regarding applicant's fourth point of argument pertaining to the multiple limitations in independent claim 14 that have allegedly been ignored by the Examiner, such is not persuasive. In Ballard et al (col. 8, lines 52-57, as cited above and in each of the previous four Office actions dating back to April 2, 2004) a skirt height of at least 1.5 inches is clearly anticipated. With respect to the selection of the divider length relative to the hydraulic resistance within the space, applicant should note that such a recitation is indefinite for the reasons as set forth in paragraph 2 above. Also, the recitations relative to the hydraulic resistance within the space and the distribution of the fluids underneath the distribution plate are not structural limitations that further limit the apparatus claims.

Conclusion


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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bushey whose telephone number is 571 272-1153. The examiner can normally be reached on M-Th 6:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Scott Bushey
Primary Examiner
Art Unit 1724


12-8-05

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